M/021/004

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MINERALS PROGRAM
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March 17, 1993

Mr. D. Wayne Hedberg
Permit Supervisor
Minerals Regulatory Program
State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Escalante Tailings Impoundment Reclamation Plan, M/021/004, DOGM November 9, 1992, Letter

Dear Mr. Hedberg:

Provided in this letter you will find Hecla's responses to the Division's letter dated November 9, 1992. We will submit a final revision of the reclamation plan incorporating the necessary changes as soon as all remaining outstanding issues have been resolved.

R67-4-110 Reclamation Plan

110.2 Roads, highwall, slopes, drainages, pits, etc. reclaimed.

Most access from the borrow areas will occur within the designated borrow areas which are already included within the disturbed area estimates. We estimate that only 2500 feet of additional access road will be needed. Road width will be kept to the minimum necessary with a maximum width of 20 feet anticipated. This would make an estimated additional access road disturbance of 1.15 acres.

Road reclamation will include ripping, retopsoiling, and contouring.

Rip-rap specifications were presented in our December 13, 1991, letter to Mr. Robert L. Morgan of the Division of Water Rights. A copy of this letter is enclosed for your reference. We have not received a response from the Division of Water Rights concerning the adequacy of our response.

We have recently evaluated the tailings in order to assess their ability to provide a stable base for placement and compaction of the clay cap layer. This evaluation indicates that when sufficiently dried out the tailings will have enough shear strength to support the stresses imposed by the equipment used during reclamation. The specification for compaction of the clay cap will be at least

95% of Standard Proctor density with a compaction moisture content within ±3% of optimum moisture.

The key factor in conducting the reclamation work on top of the tailings is the moisture content of the uppermost several feet of the tailings. The current moisture content will require a considerable amount of additional earthwork and compactive effort if the cover were to be constructed in the near-term. If the tailings are allowed to dry for another one to two years, the tailings surface will provide a more stable working surface for emplacement of the cover. To illustrate this point, a reduction in the moisture content was evident during the application of the dust suppressant in 1992, when compared to the 1991 application. Specifically, fewer problems were experienced with equipment sinking and getting stuck in the tailings surface in the 1992 application. A one to two year delay in reclamation will also provide the added assurance of additional time for tailings consolidation prior to application of the impoundment cover.

For the reasons stated above, we are proposing the following change in the reclamation schedule:

1993-1994	Maintain dust suppressant or interim cover on the tailings surface.
Summer/Fall 1995	Conduct earth moving and cover construction.
Late Fall/Early Winter 1995	Seed impoundment, borrow areas, and roads; cap and grout underdrain.

110.5 Revegetation planting program

We believe that single wire fencing (probably electrical) on the revegetated areas on Hecla land will be adequate to ensure that the revegetation effort will be a success. Hecla maintains a watchman for the site who will monitor the fencing and make repairs as and if needed. Hecla will reseed any areas in which the revegetation effort fails.

Hecla's 1991 geotechnical investigation indicates that sufficient topsoil should be available to place 8-10 inches of topsoil on the reclaimed borrow areas.

R647-4-111 Reclamation Practices

111.12 Topsoil redistribution

The topsoil stockpile is estimated to contain 59,300 yds^3. The amount of topsoil needed for the impoundment reclamation is estimated at 43,750 yds^3.

R647-4-113 Surety

Hecla agrees to post surety in the amount of $648,000 as soon as the remaining details are worked-out and the reclamation plan is approved. We also agree to the Division's changes to the Phase two surety reduction and will modify the plan accordingly during the final plan text revision.

We believe that we have adequately responded to the reclamation issues outlined in your November 9, 1992, letter. If you have questions or require additional clarification of these responses please give me a call anytime.

Very truly yours,

Gary R. Gamble

Gary R. Gamble
Environmental Engineer

enclosure

cc: Larry Drew
George Wilhelm

Hecla
MINING COMPANY
Centennial
1891 - 1991

December 13, 1991

Mr. Robert L. Morgan, P.E.
Division of Water Rights
Department of Natural Resources
State of Utah
1636 West North Temple, Suite 220
Salt Lake City, Utah 84116-3156

RE: Escalante Unit Tailings Impoundment - Responses to the Division of Water Rights Comments

Dear Mr. Morgan:

Enclosed are responses to your September 18, 1991, letter regarding the hydrology study for our Escalante Unit tailings impoundment, prepared by our hydrologic consultants.

If you have additional questions concerning the hydrologic analysis or the responses to your comments, please give me a call.

Very truly yours,

Gary R. Gamble
Environmental Engineer

GRG:csm

Enclosure

cc: D. Wayne Hedberg - Utah Division of Oil, Gas and Mining

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Other Br... Offices of James L. Grant & Associates, Inc.
Denver, CO • Hot Springs, AR • Salt Lake City, UT • San Diego, CA

December 12, 1991

Dr. Larry A. Drew
Manager of Environmental Affairs
Hecla Mining Company
6500 Mineral Drive
Coeur d'Alene, ID 83814-1931

Subject: Responses to State of Utah Comments
Tailings Dam Hydrologic Study
GSA Correspondence No. 610449.57

Dear Mr. Drew:

In response to the State of Utah Division of Water Rights (DWR) comments on our Tailings Dam Hydrologic Study, dated August 27, 1991, we have prepared the following responses to the three concerns expressed by the DWR:

1. Because of the grading and contouring of the impoundment cover, water will not pool on the cap. As shown on the longitudinal and cross section views of Drawing No. 11359 that were enclosed with the report, the cover is designed to drain surface runoff towards the ditches without ponding any water. In the event that a storm large enough to cause overtopping of the impoundment runoff ditch, water may be temporarily pooled around the edge of the impoundment cover; however, this would only occur until flow in the ditches subsided to the point that overtopping was no longer occurring. Water pooled against the cap could then drain to the impoundment runoff ditches. Only a negligible amount of seepage could occur during this time because of the low-permeability clay layer in the impoundment cover.

2. The underdrain system is currently flowing freely, with the outflow being collected in tanks at the mill site. The drains will be capped after the impoundment cover is in place. As demonstrated in the reclamation plan, seepage through the proposed impoundment cover will be an average of 0.003 inches per year, based upon simulations using EPA's Hydrologic Evaluation of Landfill Performance (HELP) model. Thus, the anticipated seepage is negligible. In addition, the dam, which was designed by Fox Consultants, Inc., was designed to withstand a full hydraulic condition. Thus, even if minor seepage were to occur and a small quantity of water accumulated in the impoundment, the design and construction of the dam has accounted for stability under those conditions. However, the amount of water that could potentially pond against the dam is small and will not pose a threat to the long-term stability of the dam.

3. The ditches will be lined with riprap in the area of the dam abutments and the hillslopes leading to the natural channel below the dam, as

shown on the enclosed drawing. The riprap specifications required to withstand erosion resulting from the 100-year runoff are as follows:

- *Impoundment Ditches*: The impoundment ditches will require riprap with a mean diameter (D_{50}) of at least 0.6 inches and a layer thickness of at least 12 inches.

- *North Abutment Hillslope*: The hillslope east of the north abutment of the dam will require riprap with a mean diameter of 2.25 feet and a layer thickness of 3.375 feet.

- *South Abutment Hillslope*: The hillslope west of the south abutment of the dam will require riprap with a mean diameter of 2 feet and a layer thickness of 3 feet.

The required size and thickness of riprap was determined from methods developed by Nelson, et. al[1]. Construction of the steep ditches will be similar to an energy dissipation basin below a culvert emerging from a steep embankment. The ditches will be partially cut into the hillsides, and will be lined with riprap. Larger riprap will be placed at the bottom of the slopes to act as roughness blocks, which will assure that the flow in the natural channel below the dam is subcritical. Material excavated from the hillsides to construct the ditches will be used in the impoundment cover. The dimensions of the impoundment ditch (trapezoidal channel with an 8 foot bottom width and 4:1 side slopes) will be maintained in the steep hillslope ditches. These dimensions require shallow excavation and will result in shallow flow depths (approximately 1 foot), which will allow the flow to spread out when it reaches the natural channel below the dam. The riprap will be placed in the areas shown on the enclosed drawing. The placement of riprap in these areas will prevent backcutting of the hillslope channels and potential erosion of the dam abutments during large storm events.

We hope that these responses to the DWR concerns meet with your approval. We appreciate the opportunity our services to Hecla on this project. If you have any questions or need additional information, please contact us.

Very truly yours,

GRANT, SCHREIBER & ASSOCIATES

Kevin S. Rauch
Staff Engineer

Dr. David L. Schreiber, P.E.
Vice President & Corporate Consultant

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1 *Nelson, J.D., S.R. Abt, R.L. Volpe, D. van Zyl, N.E. Hinkle, and W.P. Staub, "Methodologies for Evaluating Long-Term Stabilization Designs of Uranium Mill Tailings Impoundments," prepared for the U.S. Nuclear Regulatory Commission, NUREG/CR-4620, June 1986.*